

AMENDMENTS IN THE CLAIMS

1. (currently amended) A system for directing memory allocation in a data processing system, said system comprising:

means, responsive to a request for allocation of memory by an application executing on said data processing system, for selecting a block of memory to allocate to said application;

means for translating a virtual address of the selected memory block into its corresponding physical address within memory;

means for querying said physical address to determine if it is a programmatically pre-selected physical address desired by said application, wherein said desired physical address is specified by program code of said application and provided as a parameter value to components carrying out said memory allocation, which program code ~~forces an ultimate~~ enables selection of a memory block corresponding to the pre-selected physical address; [[and]]

means for passing said selected memory block for utilization by said application only when said physical address matches said desired, pre-selected physical address; and

wherein, when said data processing system is a multi-node system having a first and a second processing system each with individual memory:

said allocating means allocates a memory block on a memory of said second processing system for an application executing on said first processing system, wherein each processing system includes an allocation mechanism capable of allocating memory blocks from the other processing system;

said translating means translates said virtual address to a physical address on said memory of said second processing system; and

when said physical address of the memory block of the second processing system matches the programmed physical address of the application, passing said memory block of the second processing system to the application.

2. (previously presented) The system of Claim 1, further comprising:

means, responsive to said memory block allocated not having said desired physical address, for allocating another block of memory to said application; and

repeating said translating and querying steps for said another block of memory, wherein said allocating and repeating steps are completed until the memory blocks allocated include said

desired physical address, wherein said program code overrides a normal selection of a first available memory block by the operating system.

3. (previously presented) The system of Claim 2, said means for allocating of memory further comprising means for concurrently locking down memory blocks previously allocated to prevent repetitive selection of previously allocated memory blocks during said allocating.

4. (previously presented) The system of Claim 2, further comprising means, when said memory block allocated includes other physical addresses in addition to said desired physical address, for de-allocating portions of said memory block corresponding to the other physical addresses allocated that do not contain said desired physical address.

5. (original) The system of Claim 1, wherein said desired physical address comprises a range of memory addresses that is at least as large as a size of memory required by said application within said range of memory addresses, said system further comprising means for prompting a user to enter parameter values for said range of memory addresses and said size of memory.

6. (canceled)

7. (previously presented) The system of Claim 2, wherein:
said allocating means initially allocates all of the available memory to said application;
and said comparing means includes immediately de-allocating portions of said allocated memory not within the range of desired physical address.

8. (original) The system of Claim 2, further comprising means for selecting an algorithm for completing said allocation and repeating steps, wherein said algorithm is selected from among several available algorithms based on an indication by a user, wherein further, absent said indication, a default algorithm is automatically selected.

9. (original) The system of Claim 8, wherein said selecting means differentiates among several calculation processes for determining a maximum amount of memory to allocate during each allocating step, said calculation processes including: (1) calculating the maximum amount of memory to allocate as an amount of physical memory in the system; (2) calculating the maximum amount of memory to allocate as the result of (amount of physical memory in the system - size of the range requested) + the amount of physical memory required; (3) calculating the maximum amount of memory to allocate as an amount of available physical memory in the system; and (4) calculating the maximum amount of memory to allocate as the result of (amount of available physical memory in the system - size of the range requested) + the amount of memory required by said application, wherein said range is a range of addresses comprising said desired physical address and one of said calculation processes is utilized.

10. (previously presented) The system of Claim 8, wherein said allocating means includes means for allocating said memory block in a chunk size, which chunk size is gradually reduced as more memory with said desired physical address is allocated.

11. (original) The system of Claim 2, further comprising:

means for organizing allocated blocks of memory into address order;

means for determining a section of said allocated blocks with said desired physical address that has maximum continuity; and

means for passing said section to said application, wherein when said section is not as large as a memory space required, additional sections with said desired physical address are allocated and passed, wherein a memory space required is an actual size of physical memory required by the application and a size of said desired physical address is at least as large as said memory space required.

12. (original) The system of Claim 11, wherein said determining means comprises means for moving a size X window over said allocated blocks, wherein X is the amount of memory space required by said application.

13. (original) The system of Claim 2, further comprising:

means for organizing said allocated memory in a pattern similar to a pattern provided by a Window's operating system; and

said querying means includes means for conducting a search for a match to said pattern provided by said Window's operating system.

14. (previously presented) The system of Claim 2, wherein said data processing system comprises:

a memory allocation routine executing along with an operating system (OS) of the data processing system and which manages the allocation of memory processes of an application to a specific, pre-programmed physical memory location; and

a cache with a cache size of Z units, wherein said system includes means for providing a separation of Z units between allocated memory pages to enable tracking of cache misses.

15. (currently amended) A method for allocating memory on a data processing system comprising:

receiving a pre-programmed specific physical memory location to allocate to processes of an application;

executing said application on said data processing system, wherein said application requires access to memory of said data processing system; [[and]]

responsive to an operation requesting access to memory by said application, automatically assigning said pre-programmed specific physical memory location to said operation, wherein only said pre-programmed specific physical memory location is assigned to that application.

calculating a physical memory location corresponding to a virtual address provided by said operation; and

interactively allocating memory blocks and comparing a physical address of said allocated memory blocks with said specific physical memory location, wherein, when said allocated memory block is within said physical memory location said allocated memory block is passed to said application

responsive to some of said allocated memory block comprising all required memory within said specific physical memory location as well as other physical memory not within said specific physical memory location, de-allocating the other physical memory within memory block;

prompting a user for input of said specific physical memory location; and

prompting a user for selection of a particular algorithm to utilize within said calculating and allocating steps, wherein said algorithm is selected from among: (1) calculating the maximum amount of memory to allocate as an amount of physical memory in the system; (2) calculating the maximum amount of memory to allocate as the result of (amount of physical memory in the system - size of the range requested) + the amount of physical memory required; (3) calculating the maximum amount of memory to allocate as an amount of available physical memory in the system; and (4) calculating the maximum amount of memory to allocate as the result of (amount of available physical memory in the system - size of the range requested) + the amount of memory required by said application, wherein said range is a range of addresses comprising said desired physical address and one of said calculation processes is utilized.

16- 18. (canceled)

19. (currently amended) A computer program product for directing memory allocation in a data processing system, said program product comprising:

a tangible computer readable medium; and

program instructions on said tangible computer readable medium for:

responsive to a request for allocation of memory by an application executing on said data processing system, selecting a block of memory to said application;

translating a virtual address of said selected memory block into its corresponding physical address within memory;

querying said physical address to determine if it is a programmatically pre-selected physical address desired by said application, wherein said desired physical address is specified by program code of said application and provided as a parameter value to components carrying out said memory allocation, which program code ~~forees an~~

~~ultimate enables~~ selection of a memory block corresponding to the pre-selected physical address; ~~[[and]]~~

passing said selected memory block for utilization by said application only when said physical address matches said desired, pre-selected physical address; and

wherein, when said data processing system is a multi-node system having a first and a second processing system each with individual memory:

said allocating program instructions allocates a memory block on a memory of said second processing system for an application executing on said first processing system, wherein each processing system includes an allocation mechanism capable of allocating memory blocks from the other processing system;

said translating program instructions translates said virtual address to a physical address on said memory of said second processing system; and

when said physical address of the memory block of the second processing system matches the programmed physical address of the application, passing said memory block of the second processing system to the application.

20. (previously presented) The computer program product of Claim 19, further comprising program instructions for:

responsive to said memory block allocated not having said desired physical address, allocating another block of memory to said application; and

repeating said translating and querying steps for said another block of memory, wherein said allocating and repeating steps are completed until the memory blocks allocated include said desired physical address, wherein said program instructions overrides a normal selection of a first available memory block by the operating system.

21. (previously presented) The computer program product of Claim 20, said program instructions for allocating of memory further comprising program instructions for concurrently locking down memory blocks previously allocated to prevent repetitive selection of previously allocated memory blocks during said allocating.

22. (previously presented) The computer program product of Claim 20, further comprising program instructions for:

when said memory block allocated includes other physical addresses in addition to said desired physical address, for de-allocating portions of said memory block corresponding to the other physical addresses allocated that do not contain said desired physical address.

23. (original) The computer program product of Claim 19, wherein said desired physical address comprises a range of memory addresses that is at least as large as a size of memory required by said application within said range of memory addresses, said program product further comprising program instructions for prompting a user to enter parameter values for said range of memory addresses and said size of memory prior to execution of said application.

24. (canceled)

25. (original) The computer program product of Claim 20, wherein:

said program instructions for allocating initially allocates all of the available memory to said application; and

wherein said program instructions for comparing includes instructions for immediately de-allocating portions of said allocated memory not within said range.

26. (original) The computer program product of Claim 20, further comprising program instructions for selecting an algorithm for completing said allocating and repeating steps, wherein said algorithm is selected from among several available algorithms based on an indication by a user, wherein further, absent said indication, a default algorithm is automatically selected.

27. (original) The computer program product of Claim 26, wherein said program instructions for selecting an algorithm includes instructions for differentiating among several calculation processes for determining a maximum amount of memory to allocate during each allocating step, said calculation processes including: (1) calculating the maximum amount of memory to allocate as an amount of physical memory in the system; (2) calculating the maximum amount of

memory to allocate as the result of (amount of physical memory in the system - size of the range requested) + the amount of physical memory required; (3) calculating the maximum amount of memory to allocate as an amount of available physical memory in the system; and (4) calculating the maximum amount of memory to allocate as the result of (amount of available physical memory in the system - size of the range requested) + the amount of memory required by said application, wherein said range is a range of addresses comprising said desired physical address and one of said calculation processes is utilized.

28. (original) The computer program product of Claim 26, wherein said program instructions for allocating said memory includes instructions for allocating said memory block in a chunk size, which is gradually reduced as more memory with said desired physical address is allocated.

29. (original) The computer program product of Claim 20, wherein said algorithm comprises a window function, wherein said program instructions further comprises instructions for checking said allocated memory in blocks and sliding said window across said blocks to determine whether said blocks fit within said window, wherein said window includes a start address and an end address within said desired physical address.

30. (original) The computer program product of Claim 20, further comprising program instructions for:

organizing allocated blocks of memory into address order;

determining a section of said allocated blocks within said desired physical address that has maximum continuity; and

passing said section to said application, wherein when said section is not as large as a memory space required, additional sections with said desired physical address are allocated and passed, wherein a memory space required is an actual size of physical memory required by the application and a size of said desired physical address is at least as large as said memory space required.

31. (original) The computer program product of Claim 30, wherein said program instructions for determining a section comprises instructions for moving a size X window over said allocated blocks, wherein X is the amount of memory space required by said application.

32. (original) The computer program product of Claim 20, further comprising program instructions for:

organizing said allocated memory in a pattern similar to a pattern provided by a Window's operating system; and

conducting a search for a match to said pattern provided by said Window's operating system.

33. (original) The computer program product of Claim 20, wherein said data processing system comprises a cache with a cache size of Z units, wherein said method includes providing a separation of Z units between allocated memory pages to enable tracking of cache misses.

34. (currently amended) A data processing system comprising:

a processor that executes application processes;

a memory interconnect to said processor;

an operating system; and

program means executing on the processor for allocating only pre-selected, specific physical memory locations to said application processes corresponding to a pre-programmed physical location specified for the application processes, said program means comprising:

means for receiving a specific physical memory location to allocate to processes of an application;

means for executing said application on said data processing system, wherein said application requires access to memory of said data processing system; and

means, responsive to an operation requesting access to memory by said application, for automatically assigning said specific physical memory location to said operation.

means for testing allocation of specific physical memory locations and response to said allocation.

35. (canceled)

36. (currently amended) The data processing system of Claim [[35]]34, further comprising:

program means for calculating a physical memory location corresponding to a virtual address provided by said operation; and

program means for interactively allocating memory blocks and comparing a physical address of said allocated memory blocks with said specific physical memory location, wherein, when said allocated memory block is within said physical memory location said allocated memory block is passed to said application.

37. (currently amended) The data processing system of Claim 36, further comprising:

a memory allocation routine executing along with an operating system (OS) of the data processing system and which manages the allocation of memory processes of an application to a specific, pre-programmed physical memory location; and

wherein said memory allocation routine includes program means, responsive to some of said allocated memory block comprising all said required memory within said specific memory location, for de-allocating all allocated memory block not within said specific physical memory location.

38. (currently amended) The data processing system of Claim 37, further comprising:

program means for prompting a user for input of said specific physical memory location; and

program means for prompting a user for selection of a particular algorithm to utilize within said calculating and allocating steps, wherein said algorithm is selected from among: (1) calculating the maximum amount of memory to allocate as an amount of physical memory in the system; (2) calculating the maximum amount of memory to allocate as the result of (amount of physical memory in the system - size of the range requested) + the amount of physical memory required; (3) calculating the maximum amount of memory to allocate as an amount of available physical memory in the system; and (4) calculating the maximum amount of memory to allocate as the result of (amount of available physical memory in the system - size of the range requested) + the amount of memory required by said application, wherein said range is a range of addresses comprising said desired physical address and one of said calculation processes is utilized.

39. (canceled)